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## SOME NEW GENERA AND SPECIES OF EPEOLINE AND NOMADINE BEES (Hymenoptera, Nomadidæ)

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The following descriptions are offered in advance of a more comprehensive study, now in progress, of the genera of the bee family Nomadidæ.

### Genus EPEOLUS Latreille

*Epeolus* Latreille, 1802, Hist. nat. Fourmis, p. 427.

*Phileremus*, Cresson (nec Latreille), 1887, Trans. Am. Ent. Soc., Suppl., pp. 132, 297 (pars).

*Argyroselenis* Robertson, 1903, Can. Ent., 35:284.

Since the time of Cresson, a group of Epeoline bees with two submarginal cells has been separated from *Epeolus*, usually under the name of *Phileremus*. The latter name was proposed by Latreille for a group of distantly related bees and has long been considered synonymous with *Ammobates* Latreille. Ducke (1908) has referred one of these species with two submarginal cells to *Epeolus* (*americanus* Cresson) and has been followed in this respect by Cockerell (1921, 1934). *Phileremus montanus* Cresson is very closely related to *P. americanus* and the two should have the same generic disposition. Both species agree with typical *Epeolus* in the form of the mandibles, maxillary palpi, and structure of the terminal abdominal segments, differing only in having lost the second transverse cubital vein in the anterior wing. The group typified by *Phileremus mesillæ* Cockerell, however, is not closely related to the above mentioned Cresson species. It differs in having the mandibles simple or with a feeble inner tooth at middle, rather than with a stout subapical tooth, the wings are hyaline instead of tinted with fuscous, and the abdominal bands are entire, unbroken at the middle, and attaining the lateral tergal margins. This group is confined to the desert areas of southwestern United States and

although it seems advisable for the time being to retain these in *Epeolus*, it may sometime be necessary to separate them subgenerically. In southern California, in addition to what appears to be typical *mesillæ*, there is a larger subspecies (7.5 — 8 mm. as compared with 5.5 — 6 mm.) which differs in having the abdominal bands less distinctly defined and the dark areas clouded with white pubescence. This form may be designated as *Epeolus mesillæ palmarum*, new subspecies. Holotype female (No. 4789, Calif. Acad. Sci., Ent.) and allotype male (No. 4790, Calif. Acad. Sci., Ent.), collected by the writer at Edom, Riverside County, California, March 28, 1937, at flowers of *Larrea glutinosa*. Paratypes from Palm Canyon, Edom, and Box Canyon, all in Riverside County, in the collections of Mr. P. H. Timberlake, Mr. C. D. Michener, and the writer.

*Argyroselenis* Robertson, based on *Triepeolus minimus* Rob., is merely an *Epeolus* with two free segments in the maxillary palpi.<sup>1</sup> In both *Epeolus* and *Triepeolus* the palpi may have either one or two free segments, although there are usually two in the latter and one in the former. The palpal characters are therefore insufficient to separate the two genera. The most fundamental difference between them is in the structure of the genitalia and form of the apical abdominal segments. In the female of *Epeolus* the fifth tergite bears a silvery pubescent band and the pseudopygidial area is undifferentiated, the pygidial field of the sixth tergite is narrowly rounded at the apex, and the sixth sternite terminates in two broadly curved processes. In *Triepeolus* the fifth tergite bears a flattened, bevelled, pseudopygidial area, the pygidial field of the sixth tergite is broadly rounded, and the sixth sternite terminates in two long, straight, slender processes armed at the apex with stout, diverging spines. *Epeolus* is a Holarctic group of northern origin, *Triepeolus* an American group, probably of southern origin.

#### *Triepeolus mojavensis* Linsley, new species

Female: Black, pubescence black, variegated with whitish on pronotum and mesoscutum and with bands of white on abdominal tergites. *Head* narrower than thorax; vertex sparsely pubescent,

<sup>1</sup> Cockerell (1921, Am. Mus. Nov., 23:2) has suggested that *Argyroselenis* may be the same as *Diepeolus* Gribodo, which has two free segments in the maxillary palpi. The type species of Gribodo's genus is unknown to me but the probabilities are that it should also be considered an *Epeolus*.

moderately coarsely, closely punctured, the surface becoming rugose near the eye margins; ocelli separated by nearly one ocellar diameter; frons coarsely, closely punctured, rather densely clothed with moderately long, erect, black hairs; cheeks moderately coarsely, closely punctured, not carinate; antennæ black, scape robust, less than three times as long as broad, pedicel moderately retracted within apex of scape, about one and one-half times as broad as long, first flagellar segment shorter than second; clypeus subglabrous, finely punctured basally, a little more coarsely, closely toward apex; labrum more coarsely and less regularly punctured than clypeus, apex feebly emarginate at middle; maxillary palpi composed of two free segments. *Thorax* robust; pronotum clothed along dorsal margin with prostrate, whitish hairs; mesoscutum moderately coarsely punctured, the punctures averaging a little less than one puncture width apart, becoming sparser on posterior disk, anterior and lateral margins clothed with prostrate, whitish hairs; tegulæ subglabrous, distinctly and only moderately finely punctured; axillæ triangular but not produced as a tooth or spine; mesoscutellum moderately biconvex, punctures similar to those of mesoscutum, varying from less than one to one puncture width apart, median line and lateral and posterior margins clothed with prostrate whitish hairs; mesepisterna coarsely, closely, subrugosely punctured, clothed with erect, black hairs which are replaced by white along dorsal margin; mesosternum similarly punctured, the hairs all black; metanotum more finely punctured than mesoscutellum, clothed with prostrate whitish hairs, a little longer and suberect at sides; propodeum with triangular area shining, very finely, closely punctured, subglabrous, sides of propodeum moderately densely clothed with long, whitish, prostrate and suberect hairs; wings lightly tinted with fuscous, marginal cell longer than distance from its apex to tip of wing, first submarginal cell along posterior margin, about as long as second and third together; legs black, clothed with short, black pubescence. *Abdomen* with tergites finely, closely punctured, dark areas clothed with prostrate, brownish black pubescence; first tergite with a broad, dense band of white pubescence at sides, narrowly separated on posterior margin, more widely and arcuately at middle where it leaves an oval dark area on disk; tergites two, three, and four with a broad, white band of hairs along apical margin; fifth tergite with a broad pseudopygidial area, defined primarily by coarse, erect and suberect, brown hairs; pygidial plate of sixth tergite broadly triangular, sides straight, apex broadly rounded; sternites black, finely, closely punctured, sparsely clothed with prostrate black pubescence; processes of sixth sternite slender, straight, apices spinose and clothed with long hairs. Length: 8-10 mm.

Holotype female (No. 4801, Calif. Acad. Sci., Ent.), and two paratypes, also female, collected by the writer at the junction of Deep Creek and the Mojave River, on the Mojave Desert near Hesperia, California. The specimens were flying about the nests of an undescribed species of *Anthophora*.

This remarkably anomalous species is intermediate in many of its characters between *Triepeolus* and *Epeolus*, but seems unquestionably to belong to the former genus. The maxillary palpi are composed of two free segments, the marginal cell is elongate, and the processes of the sixth sternite are slender, straight, and spinose at the apex, but the pygidial plate of the sixth tergite is broadly triangular with the apex broadly rounded. From all of the species of *Triepeolus* known to the writer, *mojavensis* differs in the absence of carinæ on the cheeks.

#### *Protepeolus integer* Linsley, new species

Male: Black, the antennæ, mouthparts, pronotal tubercles, tegulæ, scutellum, and legs entirely, or dominantly, reddish; pubescence mostly whitish, with small patches of brown. *Head* with vertex behind the ocelli shining, subglabrous, moderately coarsely punctured, the punctures varying from less than one to one puncture width apart; occiput clothed with long, erect, pale hairs; facial pubescence very dense, white, obscuring the surface, longer and suberect on clypeus; ocelli large, nearly touching, lateral ocelli separated from margin of compound eye by less than two ocellar diameters; antennæ with scape slender, pedicel longer than broad, distinctly longer than second flagellar segment, first segment of flagellum about as long as the three following together; mandibles piceous at apex, basal half of outer face densely fringed with long, white hairs; maxillary palpi short, ultimate segment robust. *Thorax* moderately stout; pronotal tubercles clothed with white pubescence; mesoscutum punctured similarly to, but a little more closely than, vertex, the punctures finer anteriorly; anterior and lateral margins and anterior half of median longitudinal impression clothed with whitish hairs; pubescence of remaining surface shorter, brownish; lateral face of mesepisterna margined with white pubescence, disk more coarsely punctured than mesoscutum, clothed with longer brownish hairs; mesocutellum biconvex, more coarsely punctured at middle, surface subglabrous except for median line and lateral margins; metanotum subglabrous, more finely punctured than mesocutellum; propodeum with sides shining, coarsely punctured, sparsely clothed with long, white hairs; triangular area sparsely clothed with shorter, suberect hairs; legs reddish, coxæ and trochanters piceous to black, sparsely

clothed with white pubescence; wings lightly infuscated, a dusky streak beyond marginal cell, marginal cell broadly rounded at apex. *Abdomen* without a deep constriction between first and second sternites; transverse bands of tergites entire, formed of dense, short, plumose, white hairs; first and second tergites with a finely punctured, shining band along apical margins which is sparsely clothed with brownish hairs; tergites three to seven very densely white pubescent, the pubescence of tergite seven and the base of tergite five so dense as to appear velvety and more or less cream colored; tergite seven without a pygidial plate; sternite five very densely clothed with short, velvety, somewhat ochreous pubescence. Length approximately 13 mm., anterior wing 6 mm.

Holotype: male (in collection of P. H. Timberlake), from Douglas, Arizona, August 18, 1935, collected by Mr. W. W. Jones.

This species differs from *P. singularis* Linsley and Michener, its only known congener, by the more coarsely punctured integument, the sparsely pubescent metanotum, propodeum, coxæ, and trochanters, and the entire pubescent bands of the abdominal tergites. Morphological differences, some of which are probably sexual, may be enumerated as follows:

- Antennæ with first flagellar segment shorter than the following two together; anterior and lateral ocelli smaller, separated by about one ocellar diameter; maxillary palpi longer, ultimate segment slender; marginal cell obliquely truncate at apex; abdomen with a deep constriction between first and second sternites .....*singularis*, ♀
- Antennæ with first flagellar segment about as long as the following three together; anterior and lateral ocelli nearly touching; maxillary palpi shorter, ultimate segment robust; marginal cell broadly rounded at apex; abdomen without a deep constriction between first and second sternites.....*integer*, ♂

### Hesperonomada Linsley, new genus

Integument finely punctured. *Head* nearly as wide as thorax; eyes attaining on vertex a line tangent to anterior margin of lateral ocelli, very narrowly separated from base of mandibles below, inner margins converging slightly on lower face; ocelli large, anterior ocellus separated from lateral ocelli by less than the diameter of a single ocellus, lateral ocelli separated from margin of eye by about four ocellar diameters; vertex rounded above, frontal suture distinct; antennæ short, scape robust, a little more than three times as long as broad, pedicel large, broader than long, flagellar segments longer than broad, the first shorter than

second; labrum broader than long, apex broadly rounded; mandibles simple, inner margin edentate; maxillary palpi distinctly shorter than first segment of labial palpi, composed of five free segments, the first about one and one-third times as long as second, remaining segments subequal in length. *Thorax* robust; mesoscutum convex, median impression distinct; axillæ rounded; scutellum more or less evenly convex, feebly bilobed; metanotum very transverse; mesepisterna short, vertical; anterior coxæ simple, not spined; legs short, anterior femora without a tooth; wings infuscated; marginal cell acute, apex not separated from costa, submarginal cells two, subequal in length, the second cell receiving the two recurrent veins at about an equal distance from base and apex. *Abdomen* slender, pubescent; lateral tergal processes of first segment closely appressed to sternite; pygidial area of seventh tergite of male entire, rounded.

Genotype: *Hesperonomada melanantha* n. sp.

This genus is related to *Nomada* but differs in the very short, five segmented maxillary palpi, finely punctured integument, and in having the lateral tergal processes of the first abdominal segment closely appressed to the sternite. From most of the subgenera of *Nomada* (*Heminomada* and *Melanomada* excepted) it also differs in having only two submarginal cells. *Hesperonomada* superficially resembles *Epeoloides* but may readily be distinguished by the elongate (rather than minute) last segment of the maxillary palpi, pointed marginal cell which is not separated from the costa at the apex, the more widely separated eyes with inner margins converging slightly below, and the form of the pygidial area in both sexes. From the Chilean genus *Herbstiella*<sup>2</sup>, to which *Hesperonomada* may be related, it differs in the elongate (rather than broad) first discoidal cell and the simple mandibles.

#### *Hesperonomada melanantha* Linsley, new species

Female: Black, the mouthparts, flagellum, legs, and abdomen reddish; pubescence whitish. *Head* with vertex shining, finely, sparsely punctured; antennæ with scape and pedicel piceous, shining; flagellum dark reddish; frons dullish, a little more coarsely punctured than vertex, the punctures mostly separated by three or four puncture diameters; surface moderately densely,

<sup>2</sup> Hicks (1933, Am. Mus. Nov., 616:1) has recorded this genus from North America, describing a new species, *H. cockerelli* from California. An examination of the type by C. D. Michener and the writer reveals that the Hicks species is really a *Stelis* and *Herbstiella* should therefore be removed from our North American lists.

white pubescent, the hairs at side of face longer and more heavily plumose; clypeus pale reddish, darker at base, surface finely, sparsely punctured and pubescent; labrum, pale reddish, more coarsely, subcontiguously punctured; maxillæ and palpi pale reddish; mandibles reddish with the apices rufo-piceous. *Thorax* black; pronotal tubercles clothed with white hairs; mesoscutum shining, moderately coarsely punctured, the punctures of anterior discal area close, nearly contiguous, those of posterior discal area irregularly spaced, varying from less than one to two or three diameters apart, surface very sparsely clothed with depressed and suberect, plumose hairs; tegulæ rufo-testaceous, very finely punctured; mesepisterna densely clothed with white pubescence; scutellum a little more finely punctured than mesoscutum, very sparsely pubescent; metanotum sparsely punctured, densely clothed at sides with suberect, heavily plumose hairs; legs reddish, femora shining, finely, sparsely punctured, sparsely clothed with long, white, simple hairs, a few plumose hairs beneath; tibiæ and tarsi a little more closely punctured and pubescent; wings tinted with fuscous, with a pale area before apex just beyond second submarginal and discoidal cells; veins and stigma dark brownish. *Propodeum*, except triangular area, moderately finely punctured, densely clothed with depressed, laterally directed, heavily plumose white hairs; triangle very finely, closely punctured, subglabrous except for anterior angles. *Abdomen* pale reddish, tergites one to four, finely, sparsely punctured at base, with a broad, impunctate apical margin, these tergites sparsely clothed at sides with suberect, plumose hairs which under very low magnification suggest vague lateral bands or patches; tergite five finely, sparsely punctured at base, sparsely clothed with suberect, simple hairs, pseudopygidial area very densely clothed with short pubescence which obscures the surface; processes of sternite six with a number of black hairs at apex. Length: 5.5 mm.

Male: Black, including antennæ, legs, and abdomen, only the labrum, mouthparts and tarsi reddish; abdominal tergites one to five with a broad impunctate margin; pygidial area of seventh tergite finely punctured; apex broadly rounded. Length: 5.75 mm.

Holotype female (No. 4791, Calif. Acad. Sci., Ent.), and allotype male (No. 4792), captured at the Hastings Natural History Reservation near Jamesburg, California, in the Santa Lucia Mts., June 8-11, 1938, by Charles Michener. Paratypes: one male with the same data as the allotype, in the collection of Mr. Michener, one male from Antioch, California, September 10, 1936, M. Cazier collector, in the collection of P. H. Timberlake, one male from Westwood Hills, Los Angeles County, Cali-

ifornia, July 27, 1935, in the collection of the writer, and one female, Laguna Beach, California (Baker).

*H. melanantha* resembles a species of *Nomada* (undescribed?) common on *Salix* at Berkeley, California.

### Triopasites Linsley, new genus

Female: Integument finely punctured; vestiture not squamiform. *Head* nearly as wide as thorax; eyes with inner margins converging slightly below, widest at lower one-fourth, barely separated from base of mandibles; ocelli arranged in a triangle, hind margin of anterior ocellus barely intersecting a line tangent to anterior margins of lateral ocelli, anterior and lateral ocelli separated by a little less than the diameter of a single ocellus; antennæ inserted on a line a little below middle of eyes, scape slender, about four times as long as broad, pedicel nearly as long as broad, about one-half as long as first flagellar segment, first segment of flagellum a little longer than second, remaining segments subequal in length, except the last which is nearly one and one-half times as long as broad; labrum wider than long, subtriangular; mandibles short, armed with a feeble internal tooth; maxillary palpi very short, composed of three free segments which are more or less subequal in length, last segment slender, more or less acute at apex; labial palpi elongate, first segment a little half times as long as broad; labrum wider than long, subequal in length, together about two-thirds as long as second. *Thorax* robust; mesoscutum with median line impressed; axillæ very feebly dentate; scutellum almost evenly convex, indistinctly bilobed; metanotum about one-third as long as scutellum; anterior coxæ longer than broad; mesepisterna convex, anterior and ventral angles obtusely rounded; anterior wings with three submarginal cells, the first nearly as long as the second and third together, second receiving first recurrent nervure at about middle, third receiving second recurrent vein near apex, marginal cell large, nearly as long as discoidal cell, apex distinctly separated from costa, obliquely truncate; intermediate and posterior legs short, stout, their tibiæ with a few short spines on outer faces, claws simple, neither cleft nor toothed, pulvilli short, apex not swollen. *Abdomen* with five visible sternites, the sixth represented by a pair of narrow, projecting processes armed at the apex with a few diverging spines; fifth tergite with a pseudopygidial area at apex.

Genotype: *Triopasites timberlakei* n. sp.

This genus exhibits a remarkable combination of characters, some of which appear to bridge the gap between the Nomadine and Pasitine genera. In the former group it appears to be re-



lated to *Hesperonomada*, differing primarily in the form of the marginal cell (separated from costal margin), number of submarginal cells, and the short, three segmented maxillary palpi. The first of these characters will distinguish *Triopasites* from all of the Nomadine genera but *Hexepeolus*. In the Pasitine group, the genus bears a striking, although possibly superficial, resemblance to *Pasites* and *Oreopasites*. It may be distinguished from these genera by the venation of the anterior wings (marginal cell rounded at apex, three submarginal cells), the absence of carinæ along the inner ocular margins, the short, broad labrum, and the presence of a pygidial plate on the sixth abdominal tergite of the female.

#### *Triopasites timberlakei* Linsley, new species

Female: Black, mouthparts, legs, and abdomen pale reddish. *Head* sparsely clothed with short, suberect, heavily plumose white hairs; vertex finely, sparsely punctured about antennal bases, where the punctures are one to two diameters apart, more coarsely and irregularly near margin of eyes; antennæ reddish piceous, scape polished, very sparsely punctured; clypeus reddish, shining, finely sparsely punctate, the punctures mostly from four to six diameters apart, surface sparsely clothed with short, fine hairs; labrum similarly but more coarsely punctured than clypeus; mandibles pale reddish, becoming piceous toward apex. *Mesoscutum* polished, subglabrous, more coarsely punctured than head, punctures of disk largest and varying from nearly contiguous along median line to from one to three diameters apart at sides; tegulæ testaceous, darker at middle; scutellum punctured similarly to scutum, subglabrous; metanotum densely clothed with long, heavily plumose, white hairs; mesosternum shining, sparsely, coarsely punctured, the punctures mostly separated by from one to five diameters; mesepisterna moderately coarsely, closely punctured, sparsely clothed with depressed pale hairs, anterior coxæ clothed beneath with long, heavily plumose white hairs; legs moderately clothed with long pale hairs. *Propodeum* with sides coarsely punctured, clothed with long, white, plumose hairs, triangular area subglabrous, dull, tessellate. *Abdomen* dullish, tergites finely punctured at base, apical margin depressed, almost impunctate; tergites one to four sparsely clothed with very short, fine, inconspicuous pale hairs except for lateral apical margins which bear a transverse patch of long, heavily plumose, white hairs; pseudopygidial area of fifth tergite finely punctured, clothed with fine, erect, simple hairs; sternites finely punctured, sparsely clothed with long, depressed, pale hairs. Length: 5 mm.

Holotype female, from Riverside, California, May 10, 1926, in the collection of Mr. P. H. Timberlake who very kindly sent the specimen to the writer for study.

This species has almost exactly the form and coloration of an undescribed species of *Oreopasites* which occurs in the same region.

#### *Paranomada velutina* Linsley, new species

Male: Black, integument polished, shining, almost impunctate; pubescence white and ochraceous. *Head* distinctly narrower than thorax; occiput thinly clothed with pale pubescence; vertex subglabrous, with only a few, scattered hairs; ocelli small, anterior ocellus in a slight depression, separated from lateral ocelli by more than a single ocellar diameter; eyes small, attaining on vertex a line tangent to posterior margin of lateral ocelli, inner margins subparallel; frontal carina evanescent above, represented by a pit above antennal insertions; antennæ short, pedicel about as long as broad, flagellar segments subequal in length, wider than long, the first a little longer than the second; frons about antennal bases densely clothed with moderately long, suberect, pale pubescence; clypeus subglabrous, dark reddish; labrum densely pubescent; mandibles pale reddish, apices piceous; maxillary palpi very short, composed of four free segments, the first longer than broad, second about three times as long as third, third and fourth subequal in length. Thorax broad, dorso-ventrally compressed; pronotal tubercles densely clothed with pale pubescence; mesoscutum slightly convex, median impression not evident, pubescent only along lateral margins; metanotum pubescent, more densely at sides; lower mesepisterna and mesosternum subglabrous, with a few, short, widely separated, suberect, fine hairs; legs reddish brown, coxæ not strongly lamellate externally; femora moderately densely clothed with long, suberect, pale hairs, tibiæ and tarsi densely pubescent; wings tinted with fuscous, anterior pair with a large pale area before apex beyond the last submarginal and the discoidal cells, veins and stigma brownish. *Propodeum* polished, irregularly pubescent, with a patch of depressed whitish hairs along lateral margins, a patch over anterior angles of triangular area, and a patch on each side of posterior angle of area. *Abdomen* shining; tergites finely, sparsely punctured at base, with scattered, short, suberect hairs; tergites two to six with a very dense, narrow, convex band of velvety, ochraceous pubescence along apical and lateral margins; seventh tergite clothed with long, erect and suberect, ochraceous hairs, pygidial area clothed with short, suberect hairs, apex subtruncate, entire. Length: 12.5 mm.

Holotype: male (in collection of P. H. Timberlake), from Douglas, Ariz., August 10, 1936, collected by Mr. W. W. Jones.

This interesting species shares so many characters with *Paranomada nitida* Linsley and Michener, that I have placed it in the same genus in spite of the fact that the maxillary palpi are only four segmented and the coxæ lack the broad, lamellate processes. Since *P. nitida* is known only in the female and *velutina* only in the male sex, it is possible that the lamellate coxæ represents a sexual character. If this is not the case, and the palpal differences prove constant, it may be necessary at some time to separate *velutina* either generically or subgenerically. Other differences, which may or may not be sexual, include the following: (1) in *velutina* the legs, and especially the posterior tibiæ, are more slender; (2) in *nitida* the gular groove is more narrowed posteriorly; and (3) in *velutina* the anterior metatarsus is robust and angulate beyond the middle whereas it is slender throughout in *nitida*.

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AN EXOTIC CONODERUS NEW TO CALIFORNIA, WITH  
A NEW NAME FOR BICARINATUS VAN DYKE

(Coleoptera, Elateridæ)

Specimens of *Conoderus* (*Heteroderes*) *laurentii* (Guer.) have recently been collected near Huntington Park on the outskirts of Los Angeles. On July 10 and August 2, 1938, E. S. Herald, a University of California student, while working in his garden picked up several adult beetles.

This species is South American in origin, being represented in the British Museum, and Candeze Collection in the National Museum in Brussels by specimens from the West Indies, Argentina, Peru, Brazil and Colombia. It was first recorded in this country in 1927 in Southern Alabama (Hyslop, 1934), later in Florida and described by Blatchley as *fuscus*. In my review of the genus (Proc. Calif. Acad. Sci., Series 4, 20:298, 1932), I wrongly identified it as *amplicollis* Gyll.

*Conoderes bicarinatus* Van Dyke (nec Reitter, 1891), described in the same paper, should be changed to *Conoderus arizonicus* Van Dyke, new name.—Edwin C. Van Dyke.